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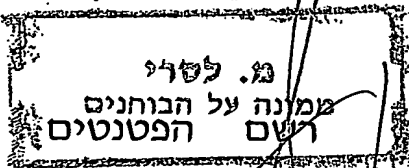
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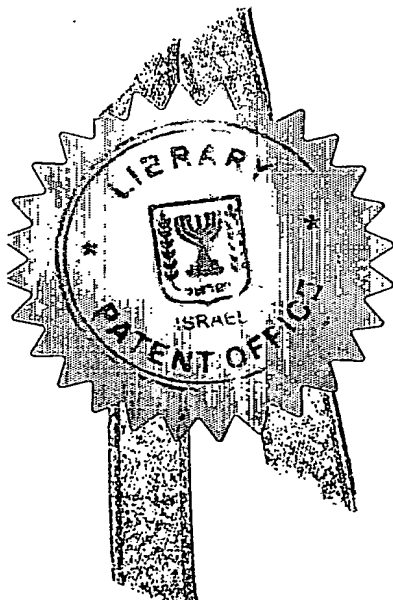
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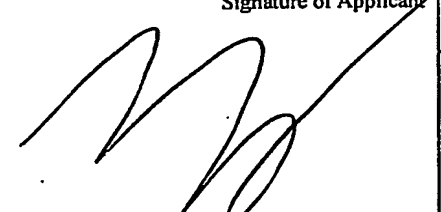
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A SECURITY DEVICE

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A SECURITY DEVICE

מכשיר להגנה

FIELD OF THE INVENTION

The present invention is generally in the field of homeland security and particularly in the field of detecting concealed explosives.

5 BACKGROUND OF THE INVENTION

Law enforcement and security personnel will often utilize hand-held metal detector devices to check the public for concealed weapons at the entrance to government offices, commercial establishments, courthouses or other locations. Most hand-held metal detectors utilize a tuned oscillator incorporating receive
10 and transmit coils, typically present in a single coil assembly. Metal is detected by frequency changes or shifts in the oscillator that occur when the transmit and receive coils are brought near a metal object.

Generally for detection, the detector must be moved in relation to the object. If the detector is not moved, even while in the vicinity of a metal object,
15 the object will not be detected. When the metal detector identifies the presence of a metallic object, typically an indication light or an audio signal, present on a wand-shaped hand-held metal detector will notify the security personnel. The security personnel will then challenge the individual by requesting a closer visual or manual search of the individual, or by drawing his officially issued weapon to
20 forestall further violence. In the case of a true security threat, the security personnel will need to subdue the intended perpetrator with all due haste. This is especially true when the perpetrator is armed with a weapon of mass destruction, such as a suicide bomber, who, when challenged, will act without regard to his own safety and will detonate his explosive device.

25 In such instances, and in the presence of other violent individuals, speed is of the essence. A short instance of time exists between detection of the suspected weapon, and the time necessary for the security personnel to ready himself for action. The security personnel must drop his hand-held metal detector and free

his hands to physically subdue the perpetrator, or to radio for reinforcements or draw his own weapon. The perpetrator may utilize those few seconds of time to act violently, for example, to activate a concealed bomb carried upon his person, which may cost the lives of the security personnel and of innocent bystanders.

5 The need exists for a metal detecting device that addresses this problem and grants the security personnel more rapid response time.

U.S. Patent No. 6,211,672 discloses a metal detector which can be strapped onto one's hand or wrist, to allow at least partial freedom of the hand for use in case of a true security risk.

10 U.S. Patent No. 5,959,451 addresses the needs of security personnel, in that it is designed to be compact, and to contain a vibrator which transmits a tactile indication to the operator when metal is detected, to prevent the suspect from being alerted by an audio signal.

An additional dilemma exists for the security personnel when his hand-held metal detector indicates the presence of a metallic object. Should he respond by drawing his officially-issued weapon, hesitation in firing the weapon may allow a violent response from the suspect. However, over-zealousness in firing may result in maiming or killing a totally innocent citizen, who happened to have a significant amount of metal on his person. Thus, use of a firearm in subduing a suspect is problematic, and over-use can be unfortunately irreversible. The need exists for a solution to security situations, which grants security personnel the ability of both a rapid and a reversible response to a suspected security threat.

15
20

SUMMARY OF THE INVENTION

The present invention provides a solution to the fundamental need of security personnel for immediate response to the threat of concealed weapons, especially weapons of mass destruction..

25

The present invention further provides a solution for providing reversible response to a suspected security threat.

This invention discloses a single device, having a metal detection unit and a disablement unit. The disablement unit is designed to temporarily and reversibly incapacitate a human, so that immediately after he is disabled he presents no threat to the security personnel, however after a certain recovery period there are
5 no residual effects from the disablement.

One preferred type of disablement unit, discussed below, comprises a stun-gun mechanism, which can deliver a high voltage electrical shock which will incapacitate the suspect for several minutes.

Thus the present invention provides a device for detecting metallic
10 counter-bounds the device comprising:.

- a) a housing for supporting the disablement unit and the metal detection unit;
- b) a control unit for activating the device .
- c) a battery electrically connected to said metal detector circuit for
15 providing power from said battery to said metal detector circuit and to the device components as necessary;
- d) switching means for activating the disablement unit.

The term "metallic counter-bands" in the context of the invention refers to any metallic object whose carrier should be neutralized. Examples of
20 metallic counter-bands are: weapons (guns, machine-gun), knives and explosives.

The metal detection unit comprises:

- a) a transmitter coil and a receiver coil defining a detection field.

25

- b) a metal detector circuit connected to said transmitter and said receiver coils for detecting the presence of metal objects in said detection field;

indicating means for alerting the user to the presence of a metallic object.

30

Preferably, the disablement unit has a stun gun mechanism for discharging a high voltage electrical shock. Preferably, the stun gun mechanism comprises the following components:

- a) a pair of electrically conductive electrodes protruding from the housing of the device at spaced apart positions;
- b) electrical circuit connector for connecting the electronically conductive electrodes to a battery;
- c) means for substantially increasing the voltage of current from the battery. The voltage increasing means are electrically interposed between the connector means and the electrodes;
- d) A manually operable switch operative to selectively make and break the electrical connection between at least one of the electrodes and the means for increasing voltage, whereby a high voltage potential is created between the electrodes upon closing of the switch means.

Typically the electric shock delivered will have a voltage of approximately 50,000-400,000 volts, and a current of 1-4 mAmp. These parameters are sufficient to induce sharp pain and involuntary muscle spasms in an individual, when the current is applied to exposed skin for several seconds. The involuntary muscle spasms tend to last for several minutes, up to approximately 15 minutes, with no permanent damage to the individual. Thus the incapacitation achieved by this preferred type of a disablement unit is reversible.

When the disablement unit is designed to achieve these electrical parameters, the electrical shock delivered will not be transferred to the security personnel, even if the suspect takes hold of exposed body areas on the security personnel. It would be preferable during use, for the security personnel to apply the electric shock to the neck or face which are typically exposed and this eliminates the possibility of activating by the electricity possible concealed wiring, therefore avoiding electrical wiring which may be concealed under the clothing of the suspect, should he be wearing an explosive device. It has been noted that electrical shock as delivered by a stun gun is more efficient in

subduing an individual, when it is applied to the neck or face, as opposed to the limbs. An electric shock delivered by the disablement unit is inaudible when the disablement unit is activated upon exposed skin, giving the suspect no advance warning.

5 Other types of disablement elements comprise an irritant, such as tear-gas or an anesthetic agent, capable of being emitted as a high pressure gas or a fluid from a canister upon activation of the switching means. An irritant or an anesthetic needs to be aimed towards the suspect's face, so as to reach the eyes, nose and mouth of the suspect. Caution should be taken by the security personnel
10 to minimize his own contact with these substances.

The metal detection unit will preferably be entirely hand-held, and will contain a standard 9V battery as the power source, with an overall wattage of 0.3 watt (300 MW), a voltage of 7-9 volts (DC), a maximal current usage of 0.033 Amp (33 MA), and a working frequency of 22 KHz. This should grant the unit a
15 detection capability of detecting a 38 mm pistol at a distance of approximately 20-30 cm, and of detecting a pocket knife at a distance of approximately 10-15 cm. A razor blade would be detected at a distance of approximately 5-10 cm. A preferable metal detecting unit will weigh approximately 300 grams. The battery may be rechargeable.

20 By one embodiment the disablement unit and the metal detection unit are integral.

By another embodiment the metal detection unit and disablement unit are an assembly- i.e. capable of t engagement. They may been manufactured individually, and assembled as a unit after manufacture in several simple steps.
25 These assembly steps could include, for instance, screwing on, ratchet attachment, or attaching by other means known to assemble two components, the disablement unit to the housing of the metal detection unit. This would be followed by electrical connection of the two units, if they share a single battery. Alternatively, each unit may contain all components necessary for its activation,
30 including the switching means and the electrical means for activation. One unit

may be placed inside a predetermined area in the housing of the other unit; alternatively, the unit can be fitted on externally to the housing.

BRIEF DESCRIPTION OF THE DRAWINGS

5 In order to understand the invention and to see how it may be carried out in practice, a preferred embodiment will now be described, by way of non-limiting example only, with reference to the accompanying drawings, in which:

Figs. 1A and 1B show two options for the metal detection unit part of the device of the invention;

10 Fig. 2 shows a device of the invention having a metal detection unit and a stun-gun as a disablement unit, both units being integral to the device.

Fig. 3 shows a device of the invention having a metal detection unit and a stun-gun as a disablement unit, and the two units adapted for being assembled with one another.

DETAILED DESCRIPTION OF THE INVENTION

Referring to Figure 1, the metal detection unit is illustrated. Figure 1A depicts a hand-held wand-type metal detection unit. A housing (11) surrounds and supports the metal detection unit. The proximal end of the detection unit is the
20 handle (2) which is grasped by the security personnel. The power supply (3) is a battery, and the on/off switching means (4) are depicted. The transmitter coil and the receiver coils which define the detection field (7) are present in a single coil assembly (5), and the detector circuit (6) is present adjacent to the coil assembly (5), and is in electrical communication with the coil assembly (5). The active
25 detection field (7) is depicted, and this area must be moved over different areas on the subject being scanned for the presence of metallic objects. A control unit (9) processes the electrical signals and coordinates the operation of the unit. Indicator means (8) are present on the handle of the unit, and indicate, preferably by means

of a visual display, the presence of a metallic object. The indicator means (8) may alternatively be audio means.

Figure 1B depicts a detection unit having a detection plate (1) at its active detecting end. The shape of the housing (11) and the relative placement of the components are the main difference between the detection units of Figures 1A and 1B. In figure 1B, the transmitter coil and the receiver coils which determine the active detection field (7) are present in a single coil assembly (5), within the detection plate (1). The detector circuit (6) is present within the handle (2) of the detection unit, as are the power-supplying battery (3), the switching means (4), the control means (9) and the indicator means (8).

Referring to Figure 2, the entire device is shown, including the preferred disablement unit which contains a stun-gun mechanism. A pair of electrodes (12) protrude from the distal end of the housing (11) at spaced apart positions. A circuit (13) is connected to the battery (3), and voltage increasing means (14) are included, to create a high voltage potential (from a relatively low voltage power supply source). A manually operable switch (15) is present to selectively make and break the electrical connection between at least one of the electrodes (12) and between the means (14) for increasing voltage, whereby a high voltage potential is created between the electrodes upon closing of the switch means (15).

Referring to Figure 3, a metal detection unit is shown of the detection-plate (1) type, which is designed to be assembled after manufacture to a disablement unit (16) having a stun-gun mechanism. The disablement unit is comprised of a pair of electrodes (12) at spaced apart positions, a circuit (13) connected to a battery (3), voltage increasing means (14) and a manually operable switch (15). All these can be snapped into appropriate places upon the housing (11) of the metal detection unit, as shown, to create a single device.

The device according to the present invention provides an effective and immediate solution to the threat presented to security personnel and secondarily to the general public, when a suspect must be searched for concealed weapons, and subdued immediately when these are found. Security personnel worldwide have
5 been maimed and killed in the course of duty due to this problem, which the present invention provides an effective and rapid solution for.

CLAIMS:

1. A device for detecting .metallic counter-bands comprising:
a disablement unit adapted to reversibly incapacitate a human, and
a metal detection unit, the device comprising:
 - 5 a) a housing for supporting the disablement unit and the metal
detection unit;
 - b) a control unit for activating the metal detection unit .
 - c) a battery electrically connected to said metal detector unit for
providing power from said battery to said metal detector unit;
 - 10 d) switch for activating the disablement unit.
2. A device according to Claim 1 being hand held.
3. A device according to Claim 1 wherein the disablement unit is a
stun gun having a mechanism for discharging high-voltage
electrical shock.
- 15 4. A device according to Claims 1-3, wherein the disablement unit
and the metal detection unit are integral.
5. A device according to Claims 1-3, wherein the disablement unit
and the metal detection unit are detachably engagable.
6. A device according to Claims 1-5, wherein the metal detection
20 unit comprises:
 - a) a transmitter coil and a receiver coil defining a detection field,
 - b) a metal detector circuit connected to said transmitter and said receiver
coils for detecting the presence of metal objects in said detection field;
 - c) indicator for alerting the user to the presence of a metallic object; and
 - 25 d) switch for activating the metal detection unit.
7. A device according to Claim 3, further comprising a battery
electrically connected to said stun-gun.
8. A device according to Claim 3, wherein the stun-gun mechanism
comprises:

- a) a pair of electrically conductive electrodes protruding from the housing of said device at spaced apart positions;
 - b) electrical circuit connector for connecting the electronically conductive electrodes to the battery;
 - 5 c) means for substantially increasing the voltage of current from the battery, wherein said voltage increasing means are electrically interposed between said connector means and said electrodes.
 - d) a manually operable switch means operative to selectively make and break the electrical connection between at least one of said electrodes and said means for increasing voltage, whereby a high voltage potential is created between said electrodes upon closing of said switch means.
- 10
9. The device according to claim 3, wherein the high voltage electrical shock discharged from the stun-gun has a voltage of approximately 50,000-400,000 volts, and a current of 1-4 mAmp.
- 15 10. The device according to claim 1, wherein the disablement element is comprised of an irritant or an anesthetic agent, capable of being emitted as a high pressure gas or a fluid from a canister upon activation of the switching means.
11. A device according to claim 5, wherein the disablement unit is adapted for being assembled on a position external to the housing of the device, and can be detachably connected to the device.
- 20 12. A device according to claim 1 wherein the metallic counter-band is selected from the group consisting of: weapons, guns machine-guns, knives and explosives.
- 25 13. A metal detection unit adapted for detachable engagement with a disablement unit, said disablement unit capable of reversibly incapacitating a human; wherein said metal detection unit is comprised of:
- a) a transmitter coil and a receiver coil defining a detection field,

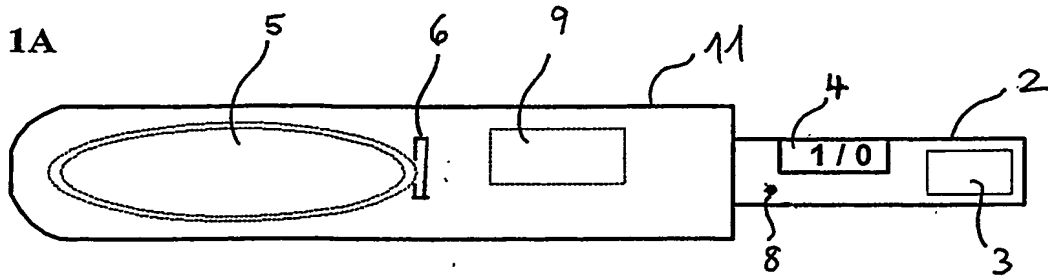
- b) a metal detector circuit connected to said transmitter and said receiver coils for detecting the presence of metal objects in said detection field;
 - c) indicating means for alerting the user to the presence of a metallic object;
 - 5 d) a housing;
 - e) a control unit for activating the metal detection unit;
 - f) a battery electrically connected to said metal detector circuit for providing power from said battery to said metal detector circuit and to the components of the unit as necessary;
 - 10 g) switch for activating the unit.
14. A disablement unit capable of reversibly incapacitating a human, adapted for assembly with a metal detector device.
15. The disablement unit of claim 14, wherein the disablement element is comprised of a stun gun mechanism discharging a high voltage electrical shock; said stun gun mechanism comprising:
- 15 a) a pair of electrically conductive electrodes protruding from the housing of said device at spaced apart positions;
 - b) electrical circuit means connector for connecting the electronically conductive electrodes to the battery;
 - 20 c) means for substantially increasing the voltage of current from the battery, wherein said voltage increasing means are electrically interposed between said connector means and said electrodes; .
 - d) a manually operable switch means operative to selectively make and break the electrical connection between at least one of said electrodes and said means for increasing voltage, whereby a high voltage potential is created
 - 25 between said electrodes upon closing of said switch means.
16. The disablement element of claim 15, further including a battery.

For the Applicants
REINHOLD COHN AND PARTNERS
By:



FIGURE 1

FIG. 1A



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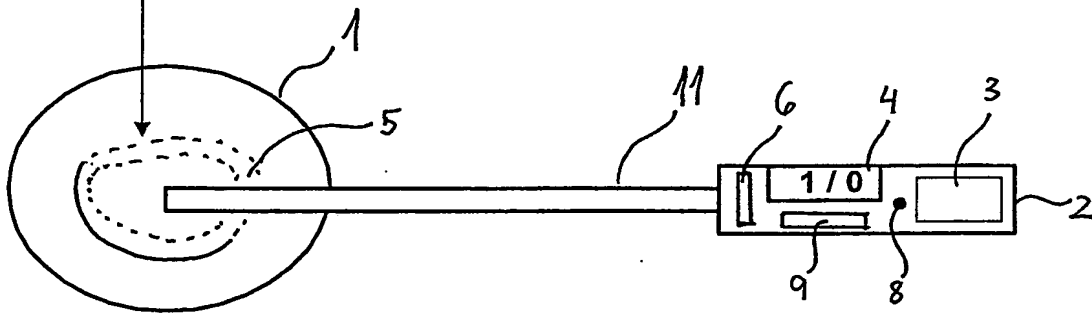


FIG. 1B

FIGURE 2

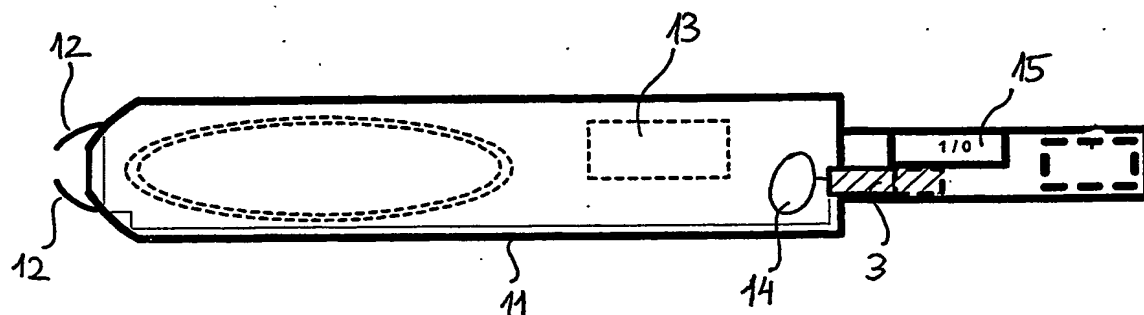
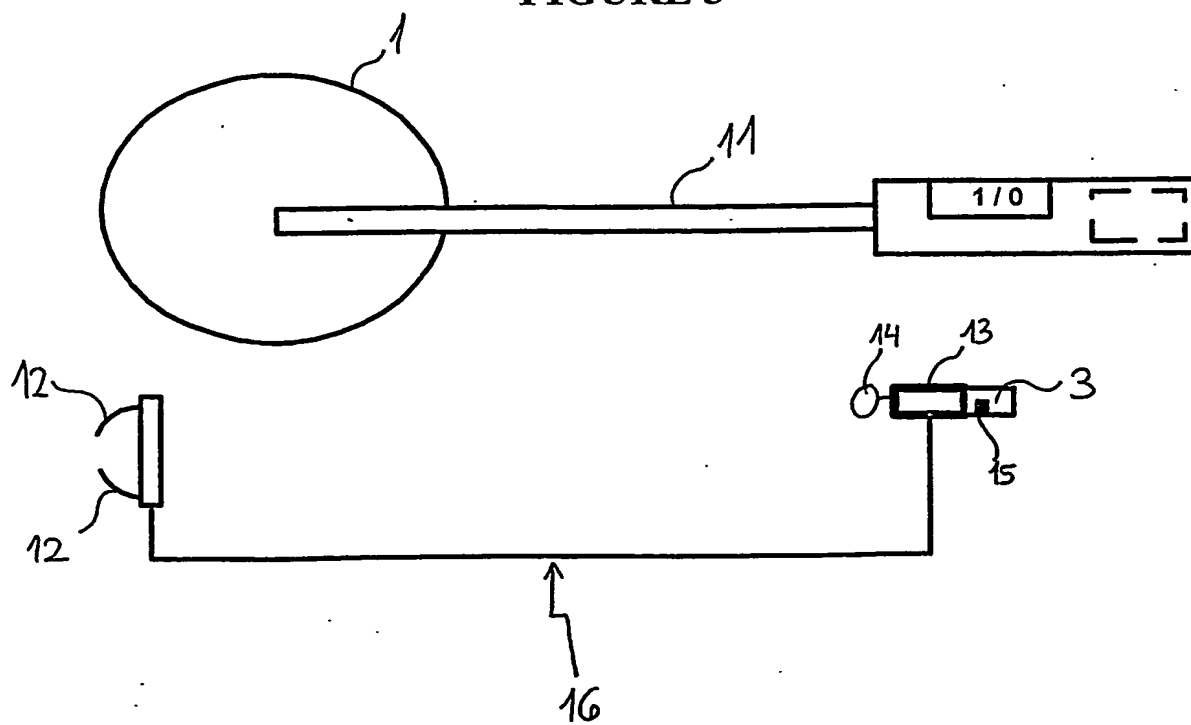


FIGURE 3



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